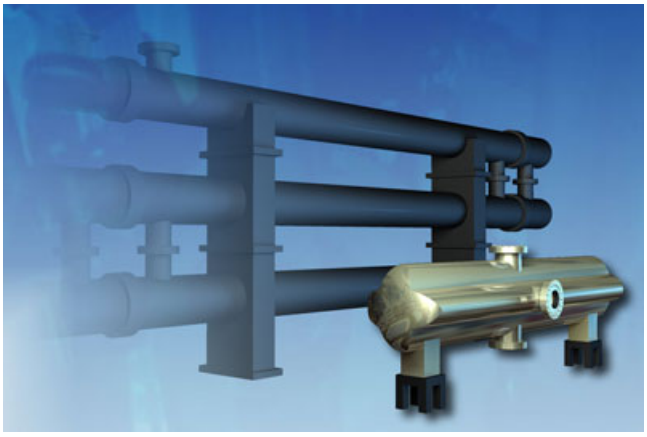

Mechanical engineering graduate student Prashaanth Ravindran spent his INL summer internship covering thermal hydraulic and safety analysis for the Next Generation Nuclear Plant (NGNP) project.

Graduate student intern designs nuclear reactor component model in mere months

By Brianna McNall, *INL Nuclear Science & Technology intern*

Three months is a tough deadline to meet for scientific research.

Prashaanth Ravindran, a mechanical engineering graduate student at the University of Texas at Arlington, came to Idaho National Laboratory as an intern for summer 2010. His research specialization — using numerical simulations to determine protocols for hydrogen safety — came in handy when he was assigned to a project covering thermal hydraulic and safety analysis for the Next Generation Nuclear Plant (NGNP) project.

Over the course of his summer internship, Ravindran was assigned the task of analyzing an intermediate heat exchanger for a very high temperature reactor. For his analysis, Ravindran created a model of the heat exchanger using RELAP5-3D, a modeling code developed at INL.

Ravindran is a graduate student at the University of Texas at Arlington.

The project focused on one specific type of intermediate heat exchanger — the printed circuit heat exchanger (PCHE). Ravindran's project, "Intermediate Heat Exchanger Design for Next Generation Nuclear Plant," created a model of that exchanger that could be expanded later.

"I have designed a model to test a compact heat exchanger and in the future, it can be coupled to a reactor loop to assess the safety factors," Ravindran said.

Since he was working on safety analysis for the NGNP, Ravindran had mentors from two different areas. He worked under Thermal & Safety analyst Nolan Anderson and Advanced Heat Transport lead Piyush Sabharwall. With their help, and the help of other INL researchers like Cliff Davis and Paul Bayless, Ravindran was able to create a computer simulation of the heat exchanger, which can be used for future safety analysis.

"It feels good to be a part of something which can change people's lives," he said. "I think the groundwork has been laid for something promising."

Ravindran also said that his summer at INL was a "busy but rewarding experience." He and his mentors will be publishing their findings from this summer's project as INL reports.

Feature Archive